

REMARKS

Claims 1, 5, 7, 8, 11, 12, 15, 16, 19, 21-23, 25-42, 44-46, 48, 50, 53-55, 59 and 60 are in this application and are presented for consideration. By this amendment, Applicant has amended claims 1, 5, 23 and 28.

Claims 1, 5, 7, 8, 11, 12, 15, 16, 19, 21-23, 25-42, 44-46, 48, 50, 53-55, 59 and 60 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Fadaie (U.S. 5,328,319).

The present invention relates to a device and a method for handling substantially rod-shaped objects. The method and device include a gripping device that has a plurality of gripping elements. A moving means moves one or more of the plurality of gripping elements. Each gripping element is movable relative to an adjacent gripping element via the moving means. Objects are provided in a first geometrical arrangement. The first geometrical arrangement of objects is modified after gripping the objects with the gripping device by moving the one or more of the gripping elements with the moving means such that the objects form a modified geometrical arrangement having a modified packaging density. The modified packaging density is greater than the first packaging density. This advantageously allows the spacing of the objects to be optimized so that more objects can be arranged within a loading aid since the packaging density is significantly increased.

Fadaie discloses a mixing station at which is located a robot 10. The robot 10 includes a robotic arm 12 having an article engaging means 14 attached thereto. Four conveyors 16, 18, 20 and 22 receive containers in the form of cartons or boxes 24 filled with plastic cups from pallets. The boxes 24 are discharged onto an intermediate conveyor 26. Intermediate conveyor

26 transports containers 24 to a flap opening station 28 at which the flaps are opened and routed to a feed conveyor 30 which moves the opened boxes to the mixing station at robot 10. When arriving at the mixing station the boxes are fully opened at the tops thereof to disclose the stacks of cups 32 within the interiors of the containers. Retention bars 36 are provided at the mixing station to prevent the flaps of the containers from closing. An article engaging means 24 is positioned by the robot over two adjacent boxes 24 located at the mixing station. A robotic arm 12 lowers the article engaging means 24 so that the follower heads 56 of the follower elements 52 engage and enter into the top most cups of the stacks disposed thereunder. Clamping elements 50 engage the cups and settle between adjacent cups. The engaged stack of cups are removed from their respective containers by raising the article engaging means 14 so that the bottoms of the stacks of cups clear the tops of the containers. The robot and the article engaging means cooperate to transport the removed stacks of cups to containers differing from the containers from which they were removed so that a desired mix of colors within any given container can be obtained.

Fadaie fails to teach and fails to suggest the combination of gripping objects in a first geometrical arrangement with one or more gripping elements and moving the objects after the objects have been gripped in the first geometrical with a moving means such that one or more gripping elements are moved to form a modified geometrical arrangement of the objects that has a modified packaging density. According to the invention, the modified packaging density is greater than the packaging density of the first geometrical arrangement of the objects. At most, Fadaie discloses an article engaging means 14 that engages two sets of two rows of cups

and rotates the cups after gripping them. According to Fadaie, the article engaging means 14 then deposits the cups in the boxes such that the inserted rows take up the spaces of the removed rows. However, the article engaging means 14 of Fadaie does not have movable gripping elements that are moved to modify the packaging density of the cups after the article engaging means 14 grips the cups. This disadvantageously fails to optimize the spacing of the objects as featured in the present invention. Compared with Fadaie, the objects of the present invention are gripped in a first geometrical arrangement with one or more gripping elements and the first geometrical arrangement is modified after gripping the objects by moving one or more gripping element with a moving means so that the objects form a modified geometrical arrangement having a modified packaging density. This advantageously allows the spacing between objects to be modified so that more objects can fit into a loading aid. In contrast to Fadaie, the article engaging means 14 does not have movable gripping elements that are moved to modify the packaging density of the cups after the cups are gripped since the article engaging means 14 of Fadaie only picks up and rotates the cups. However, the follower elements 52 of the article engaging means 14 of Fadaie are not moved to change the spacing between the cups such that the packaging density of the cups is modified. Fadaie clearly teaches that the cups are gripped with the article engaging means 14 and the cups are rotated, but the follower elements 52 are not moved to change the packing density of the cups as claimed. As such, Fadaie fails to teach or suggest modifying a packaging density of a first geometrical arrangement of objects after the objects have been gripped with at least one gripping element by moving one or more gripping elements such that a modified geometrical arrangement of

objects is formed with a modified packaging density. Accordingly, Applicant respectfully requests that the Examiner favorably consider claims 1, 23 and 59 as now presented and all claims that respectively depend thereon as the prior art as a whole takes a different approach and fails to teach or suggest important features of the claimed combination.

Favorable consideration on the merits is requested.

Respectfully submitted
for Applicant,



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